

CLAIMS:

1. A network switch for network communications, said network switch comprising:

a first data port interface, said first data port interface supporting a plurality of data ports for transmitting and receiving data at a first data rate;

a second data port interface, said second data port interface supporting a plurality of data ports for transmitting and receiving data at a second data rate;

a third data port interface for transmitting and receiving data at a third data rate;

a CPU interface, said CPU interface configured to communicate with a CPU;

a first internal memory, said first internal memory communicating with said first data port interface, said second data port interface, and said third data port interface;

a first memory management unit, said first memory management unit including an external memory interface for communicating data from at least one of said first data port interface and said second data port interface to and from an external memory;

a second internal memory, said second internal memory communicating with said third data port interface;

a second memory management unit, said second memory management unit controlling access to and from said second internal memory; and

a communication channel, said communication channel for communicating data and messaging information between said first data port interface, said second data port interface, said third data port interface, said first internal memory, and said first memory management unit,

wherein said first memory management unit directs data from one of said first data port, said second data port, and said third data port to one of said internal memory and said external memory interface according to a predetermined algorithm.

2. A network switch as recited in claim 1, wherein said second memory management unit is configured to monitor the communication channel and receive data packets from the communication channel which are destined for the third data port interface from one of the first data port interface and the second data port interface.

3. A network switch as recited in claim 1, wherein the network switch includes an appending unit for appending a module identification header to data packets which are being sent to a destination port from the third data port interface.

4. A network switch as recited in claim 3, wherein the module header appended to the data packet by the appending unit includes a module ID bitmap which identifies other network switches to which the data packet should be sent via the third data port interface.

5. A network switch as recited in claim 3, wherein the module header appended to the data packet by the appending unit includes mirroring information which identifies a port on a remote network switch to which the packet should be sent.

6. A network switch as recited in claim 3, wherein the module header includes data identifying a class-of-service priority for the data packet.

7. A network switch as recited in claim 3, wherein the module header includes data which identifies the network switch as a source network switch for the packet.

8. A network switch as recited in claim 1, wherein said third data port interface includes a plurality of tables thereupon.

9. A network switch as recited in claim 8, wherein the plurality of tables include at least one of a programmable virtual LAN (VLAN) table, a multicast table, an IP multicast table, a trunk group bitmap table, a priority-to-class-of-service queue mapping table, and a port-to-class-of-service mapping table.

10. A network switch as recited in claim 1, wherein said first data port interface is configured to support a plurality of data ports transmitting and receiving data in accordance with an Ethernet standard,

said second data port interface supports a plurality of data ports transmitting and receiving data in accordance with an Ethernet standard, and

wherein said third data port interface is a high-performance interface for communicating with other network switches in a stacked configuration.

11. A network switch as recited in claim 10, wherein said third data port interface contains a single input/output port thereupon.

12. A network switch as recited in claim 1, wherein said first data port interface and said second data port interface include a packet slicing unit for slicing variable length packets into a plurality of equal length cells.

13. A network switch as recited in claim 1, wherein said communication channel comprises three communication channels.

14. A network switch as recited in claim 13, wherein said three communication channels include a first channel for communicating cell data between the plurality of data ports in the first data port interface, the plurality of data ports in the second data port interface, the third data port interface, the first and second internal memories, and the first and second memory management units, said three communication channels also including a second channel, synchronously locked with the first channel, for communicating message information corresponding to the cell data on the first channel, said communication channels also including a third channel, independent from said first and second channel, for communicating sideband message information.

15. A network switch as recited in claim 1, wherein said first data port interface, second data port interface, third data port interface, CPU interface, first internal memory, first memory management unit, second internal memory, second memory management unit, and said communication channel are integrated on a single application specific integrated circuit (ASIC) chip.

16. A network switch as recited in claim 1, wherein the second internal memory and the second memory management unit are part of the third data port interface.

17. A network switch as recited in claim 1, wherein said second memory management unit includes a scheduler, in communication with the second internal memory, for controlling forwarding of packets out of the network switch from the second internal memory.

18. A network switch as recited in claim 17, further comprising an arbiter, in communication with the scheduler, for controlling access to a communication line to which the data port is connected.

19. A network switch as recited in claim 1, further comprising a stripping unit for stripping a module header from packets which are being switched out of the network switch.